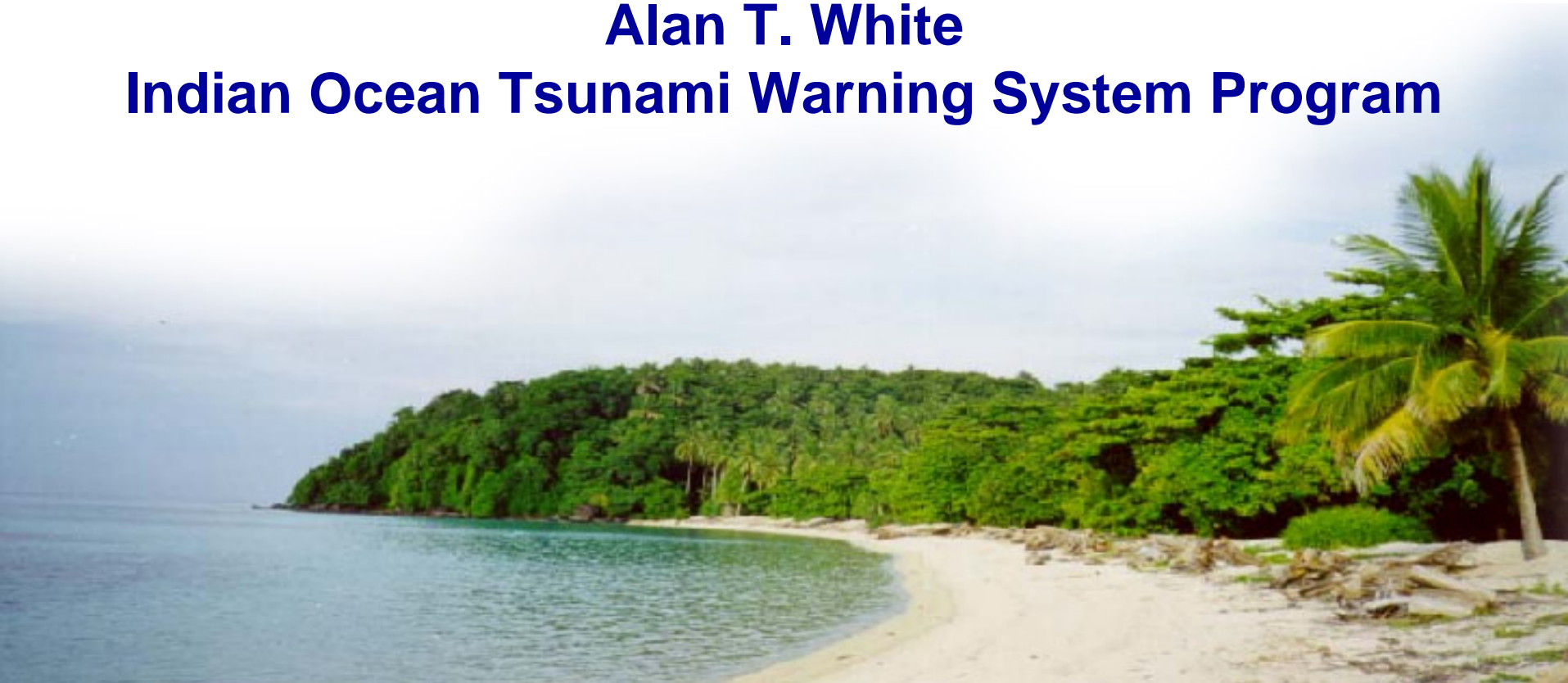




# Coastal Resilience through Integrated Coastal Management

**Alan T. White**

**Indian Ocean Tsunami Warning System Program**



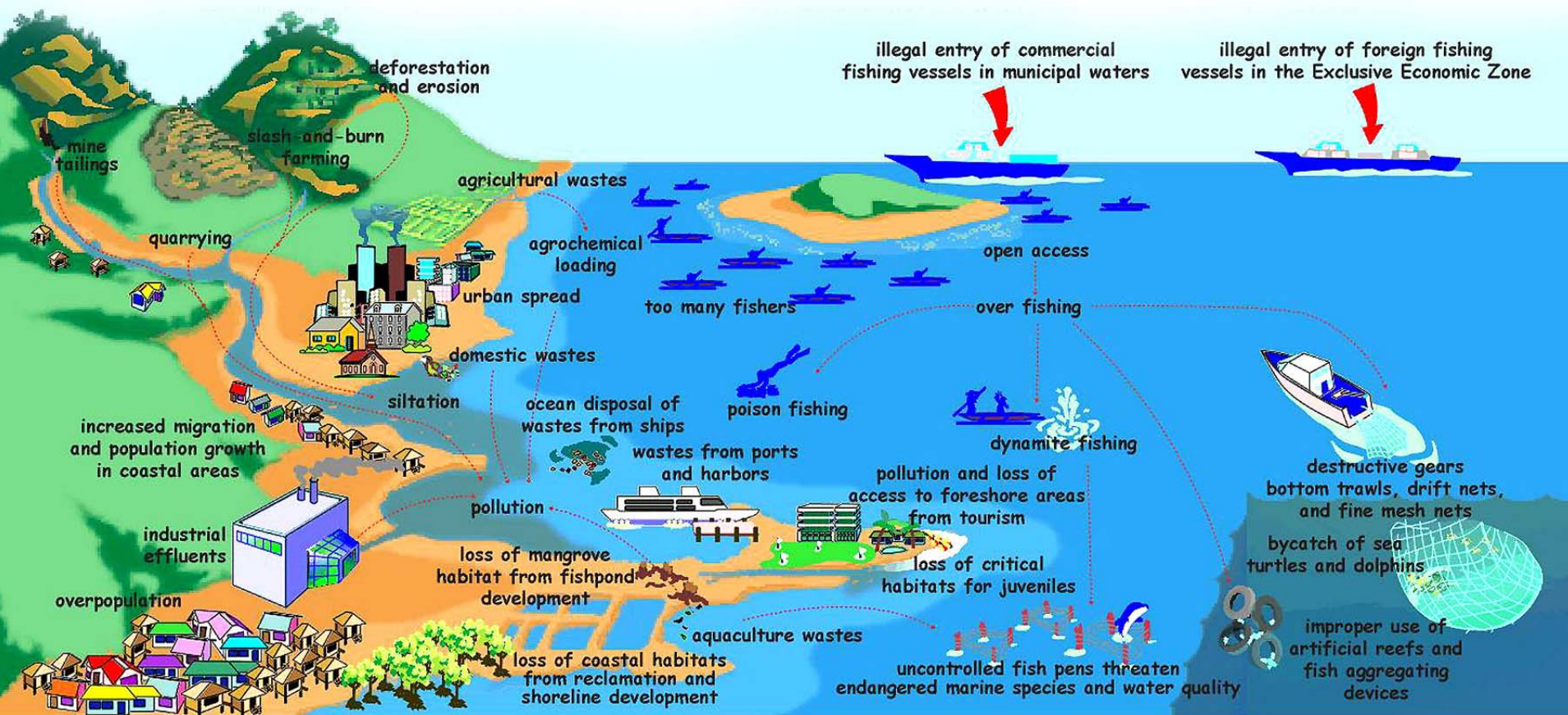
# The coastal zone: An endangered environment

Overexploitation and destruction

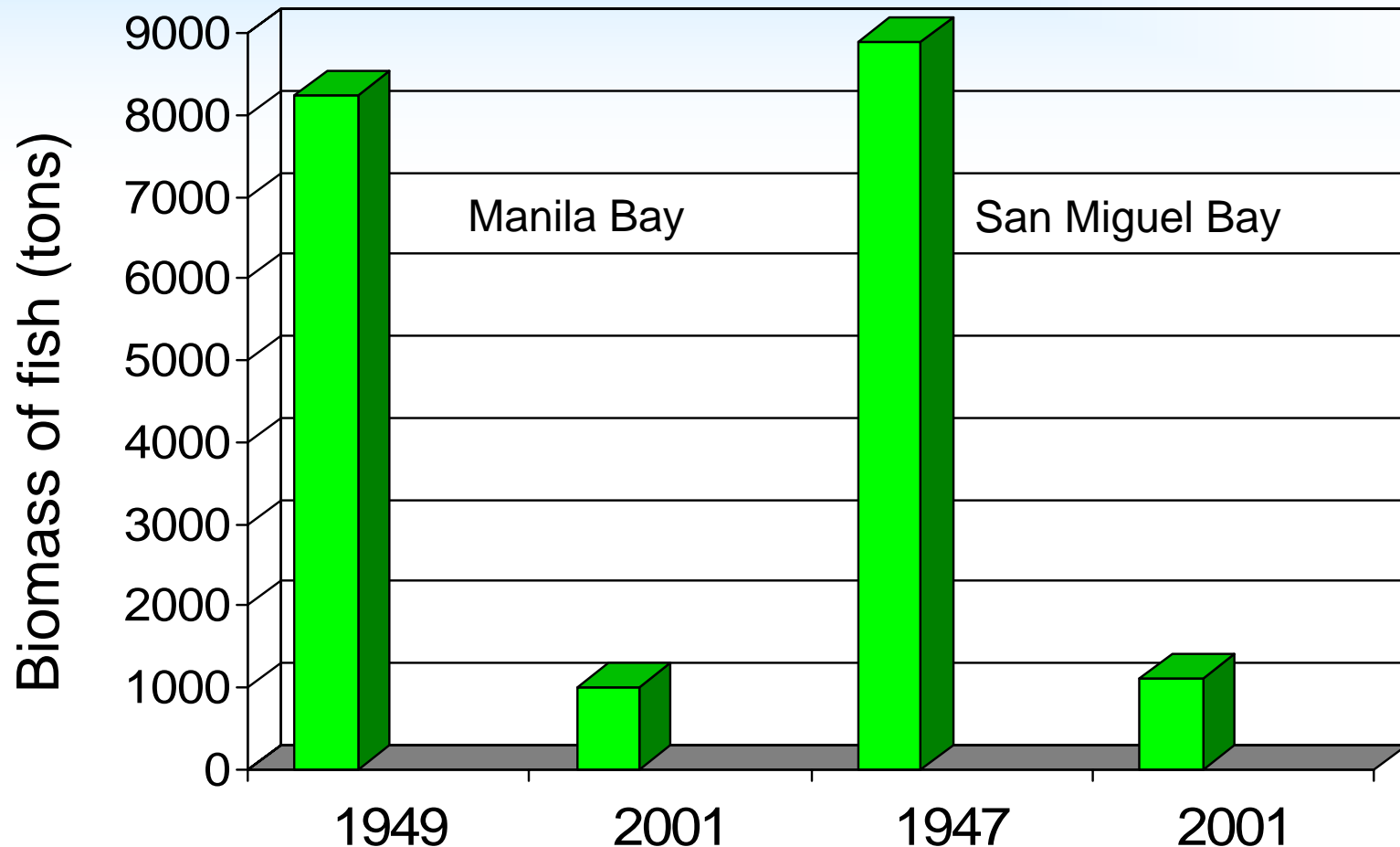
Unplanned development and natural disasters

Increasing pollution / Resource use conflicts

Unclear and weak institutional arrangements



# Fish stocks today are 10% of what they were in the 1940s





# Numerous lessons but from troubled Asian coasts

- About 3 to 4 out of 10 people live under poverty line
- Population growing at between 1.5 and 2% annually
- Up to 50% of population depends on coastal fisheries for animal protein and livelihood
- Need to implement integrated management measures is urgent



# What erodes coastal resilience?

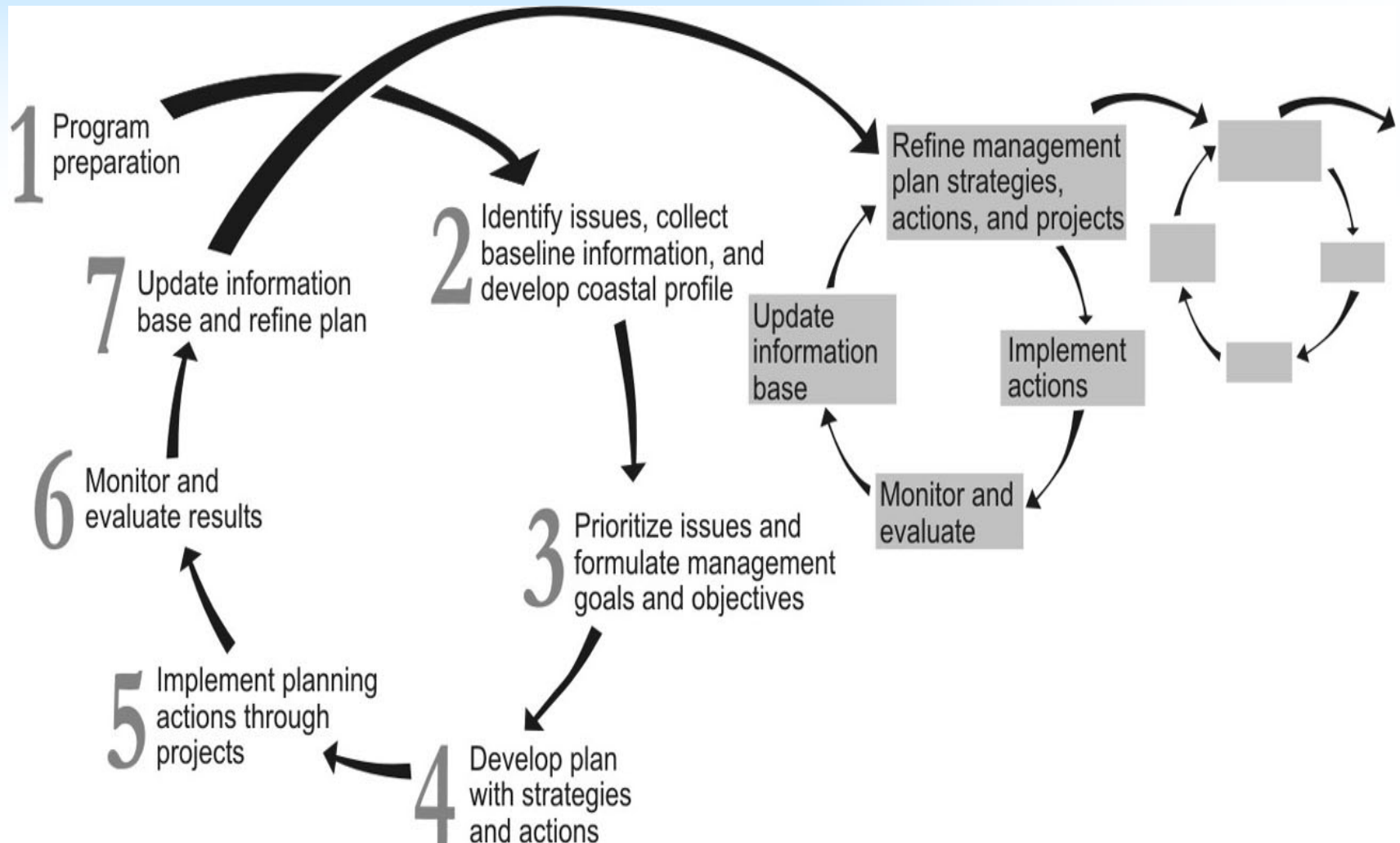
- Chronic degradation of mangroves, reefs and beaches increased vulnerability in 2004
- Weak connection between people and their coastal environment and resources
- Social cohesion weak or not present
- Low diversity or weak local economic portfolio
- Adaptive management not present
- Declining diversity of coastal ecosystems
- Governance structures weak or nonexistent
- Lack of sense of scale in management

# Basic elements of governance to support coastal resilience



- Socio-ecological resilience must be understood at broad scales
- Translate ecological knowledge into local governance
- Multilevel social networks
- Legal, political and financial frameworks line-up
- Management authority must cross boundaries (e.g. be integrated)
- Standard social norms must change

# Cyclical Planning Process Leads to Adaptive Management



# ICM timeline in Sri Lanka [example]

	1900 - 1980	1980-1990	1991-2006
Legal regimes	<p>Laws support fisheries development</p> <p>Open access regimes</p> <p>Central Control</p>	<p>Coastal environmental laws enacted</p> <p>CCA 1981, 1988</p> <p>NARA 1981</p>	<p>Coastal 2000 policy</p> <p>ICM framework in national plans (90,97,04)</p> <p>Co-management through Special Areas</p>
Implementation	<p>None</p>	<p>First national coastal plan--1990</p> <p>Shoreline setbacks initiated</p>	<p>Donor ICM projects</p> <p>Special Area Management projects</p> <p>National ICM implementation, setbacks and more</p>



# Coastal Management Measures for Tsunami and Multi-Hazard Mitigation

- ✓ Clear marking of flood prone/vulnerable areas
- ✓ Exit routes and gathering areas
- ✓ Protection of coastal habitats and features
- ✓ Active participation in planning and management
- ✓ Development setbacks in frequently flooded areas
- ✓ Building codes that consider disaster scenarios



# Sustainable ICM Programs—lessons from Indonesia and Philippines

1. Need for management to improve biophysical conditions
2. Importance of stakeholder participation in decision process
3. Contribution to economic returns and livelihood
4. Having adequate legal and policy framework in place
5. Having capacity for law enforcement
6. Building durable institutions beyond leadership changes
7. Role of the private sector in performing tasks
8. Avoid becoming too dependent on “project” vs government
9. Education and raising awareness to accomplish tasks

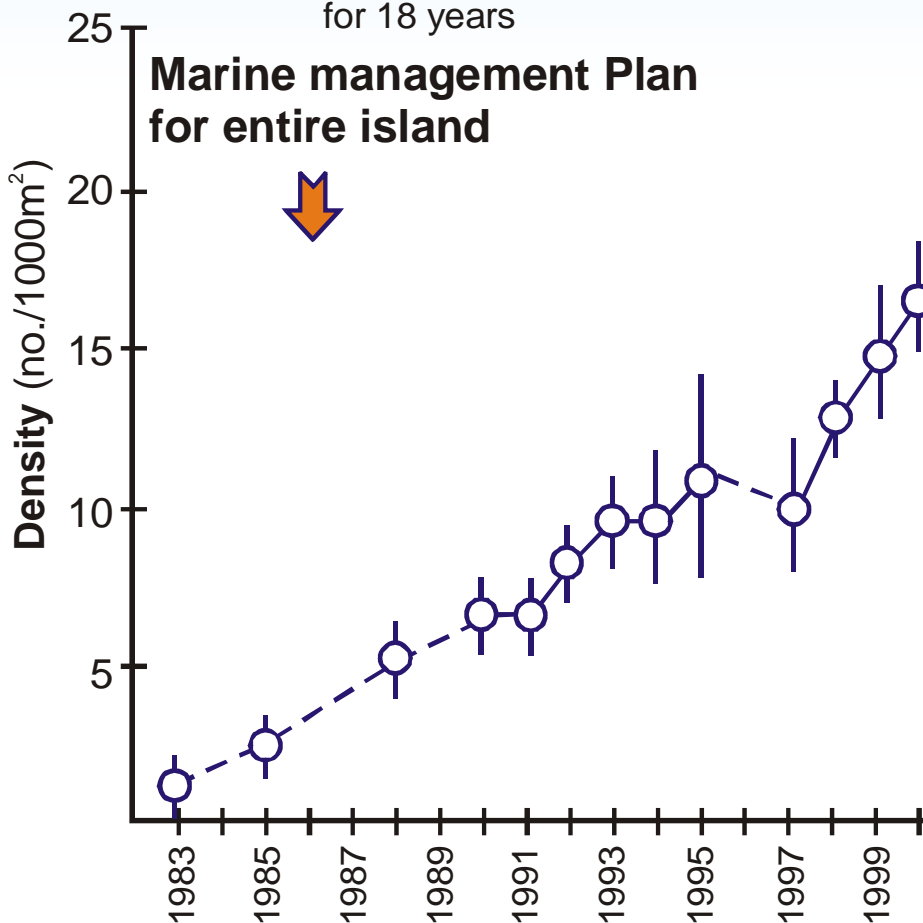


# Biophysical results known and provide incentives for ICM--increases of fish in MPAs

## Apo Reserve

Closed to Fishing  
for 18 years

**Marine management Plan  
for entire island**

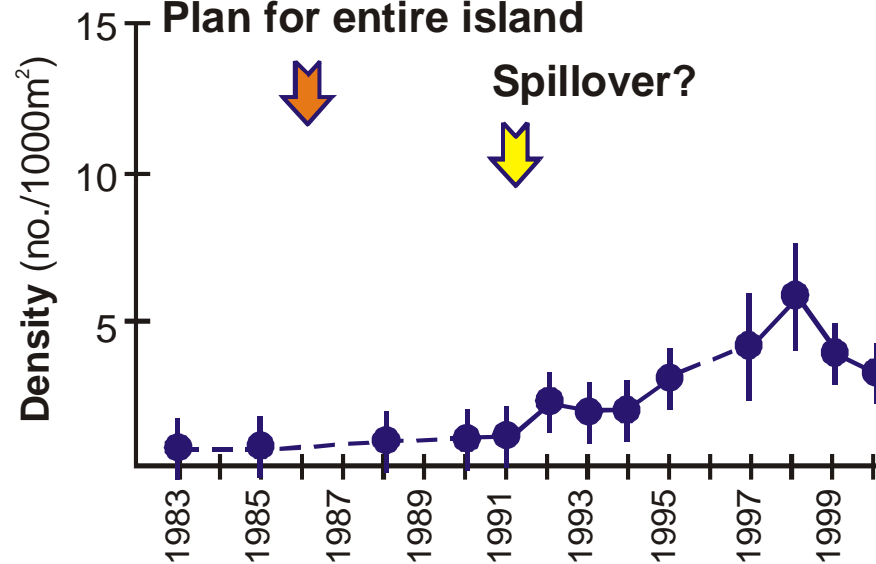


## Apo Non-reserve

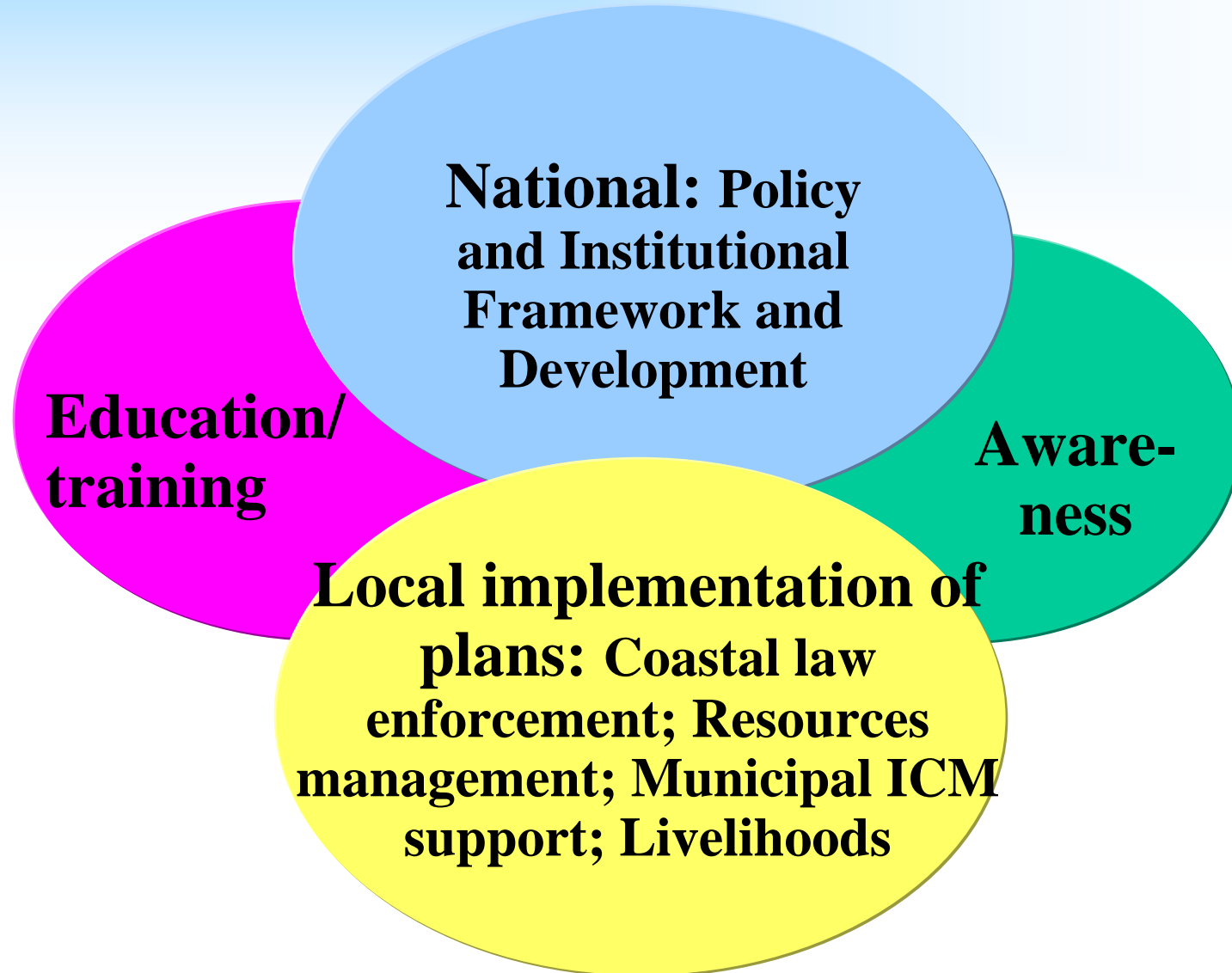
Open to Fishing

**Marine Management  
Plan for entire island**

**Spillover?**

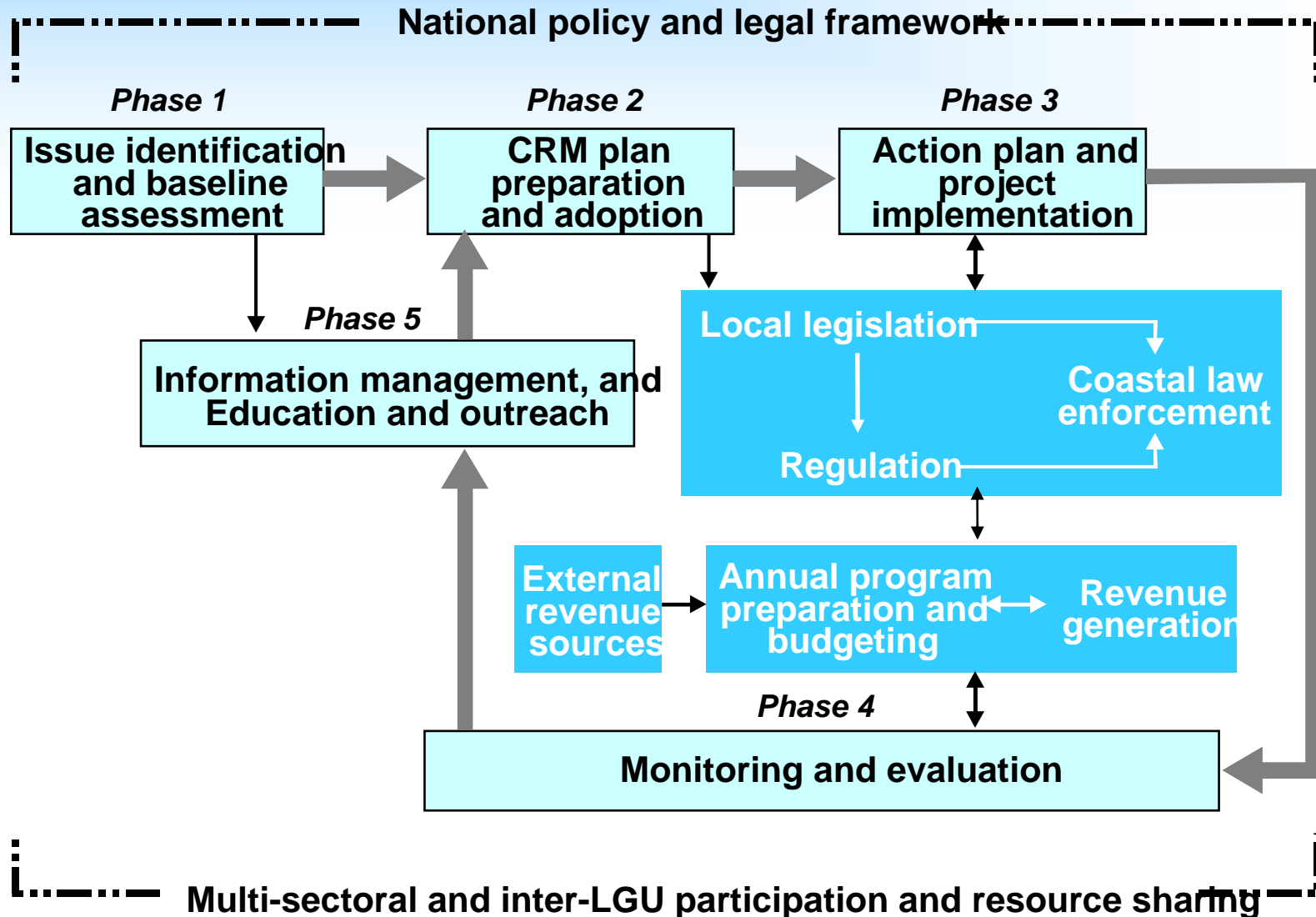


# Components of Coastal Resilience and ICM





# Coastal planning process adapted for Philippine local government



# **Local Government Key Result Areas (ICM Benchmarks)**

- 1. Multi-Year ICM/CRM Plan with Disaster Contingencies**
- 2. Coastal Resource Assessment**
- 3. ICM/CRM-Related Organizations**
- 4. Annual Programming and Budgeting**
- 5. Shoreline/Foreshore Management**
- 6. Best ICM or CRM practices being implemented:**
  - a. Local Legislation**
  - b. Local Government Jurisdictional Delineation**
  - c. Coastal Zoning**
  - d. Fisheries Management**
  - e. Coastal Law Enforcement**
  - f. Marine Protected Area**
  - g. Mangrove Management**
  - h. Disaster Action Plan/Escapes Routes/Procedures**
  - i. Coastal Environment-Friendly Enterprise Development**



# ICM Benchmark/Certification System

(18 Municipalities and 2 Cities Certified—Philippines)

## Level 1 - Beginning CRM

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*Acceptance of CRM as a basic service of municipal/city government with planning and field interventions initiated*  
(1 to 3 years)

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- ✓ Multi-year CRM drafted
- ✓ Baseline assessment conducted
- ✓ CRM-related organizations formed and active
- ✓ Annual budget allocated for CRM
- ✓ Shoreline/foreshore management measures planned and initiated
- At least 2 CRM best practices planned and initiated

## Level 2 - Intermediate CRM

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*Implementation of CRM plans underway with effective integration to local governance*  
(2 to 5 years)

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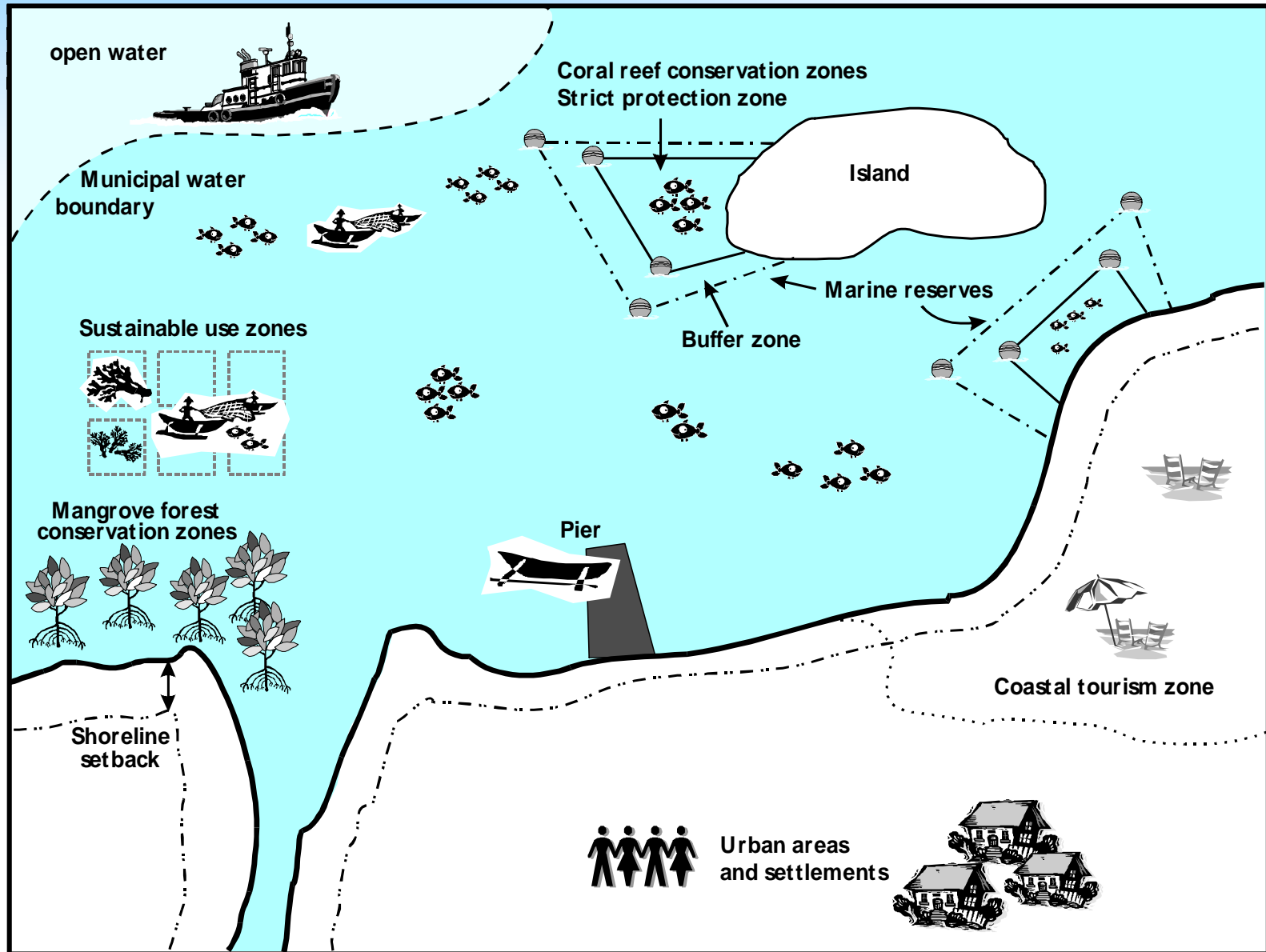
## Level 3 - Advanced CRM

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*Sustained long-term implementation of CRM with monitoring, measured results, and positive returns*  
(5 years or more)

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# “Best Practices” and zoning municipal waters use





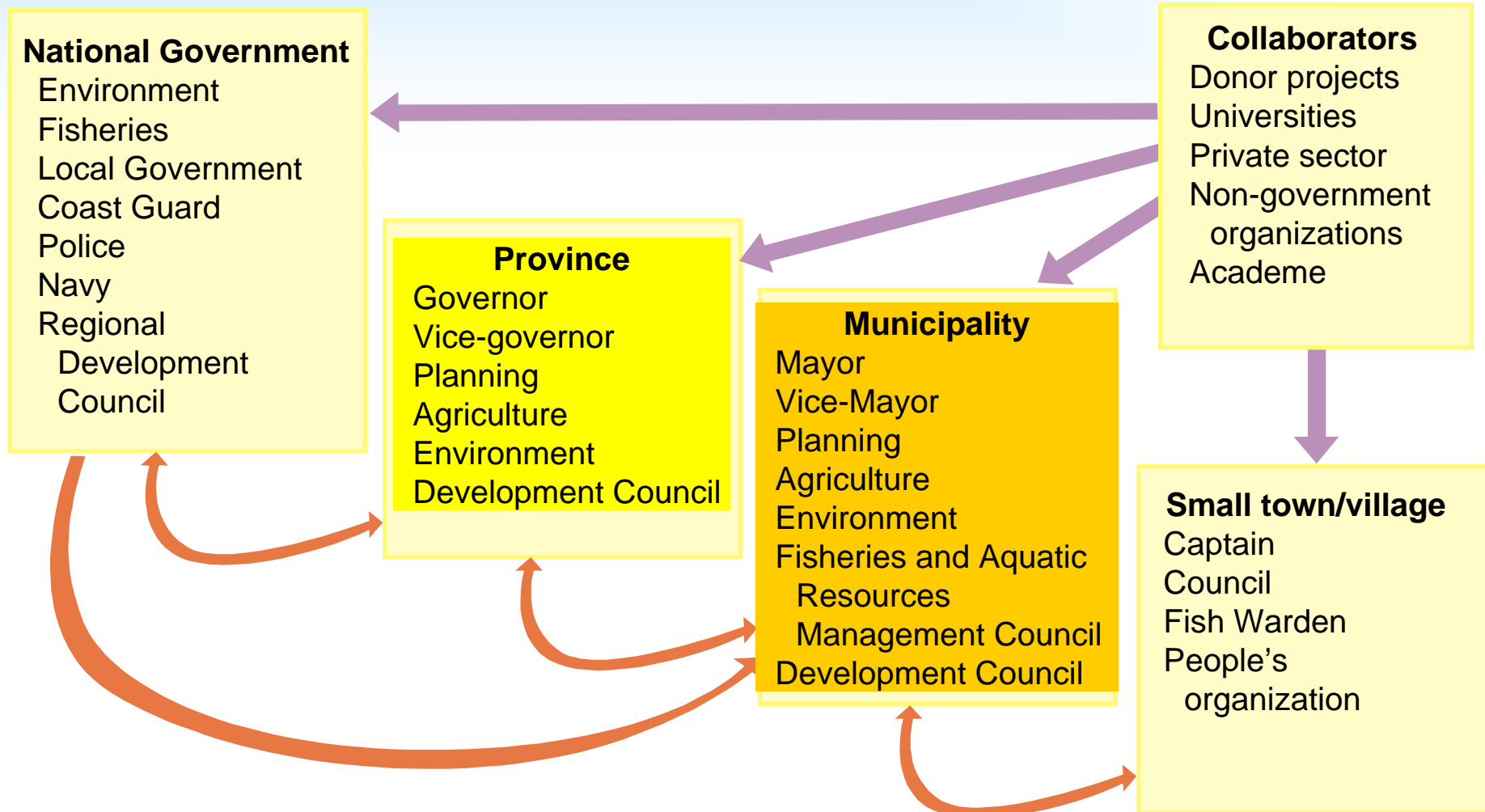
# **Lessons from ICM implementation in more than 100 Philippine local governments (along 3000 km)**

- Early community involvement through baseline assessment and planning is essential to success
- Outside technical and financial assistance is critical, but local governments and communities must allocate resources, budgets and personnel to sustain activities
- Municipalities/cities must enforce ordinances based on their local priorities determined in ICM planning
- Multi-municipal/city plans, ordinances and exchange of information for common interest areas (e.g. bay or fishing ground) needed to show consistency of purpose & coordination to stakeholders

## Common lessons... *continued*

- Alternative livelihoods needed to relieve pressure on resources through environment friendly options
- Education, information sharing and training essential to enhance participation
- Accountability for ICM by local governments to their communities and to higher government per the “CRM benchmark and certification system” proving to be stimulus for more and improved ICM in country
- Results of ICM must be immediate and communicated often to stakeholders

# Institutions affecting coastal management in the Asian countries



**ICM is growing and its potential to build coastal resilience—both human and ecological—is substantial. Let's learn from the emerging lessons.  
Thank you!**

**See: [iotws.org](http://iotws.org); [oneocean.org](http://oneocean.org) and [coast.ph](http://coast.ph)**



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**Indian Ocean  
Tsunami Warning System  
Program**